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AUTHOR Place, Carol: And Others
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ABSTRACT

Presented is an overview of the pilot project of the Visiting Women Scientists Program that involved 40 women scientists accompanied by field representatives, who met with tenth-grade students in 110 high schools in the United States. The meetings included seminars, individual class discussions, and informal discussions with school personnel. The selection of the women scientists, the schools, the format of the meetings, and an evaluation are described. (SA)

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The Visiting Women Scientists Program
1978-79
Highlights Report

Carol Place, Larry E. Conaway, Iris R. Weiss, and Mary Ellen Taylor
Research Triangle Institute, Research Triangle Park, N.C.

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RESEARCH TRIANGLE PARK, NORTH CAROLINA 27709

I. OVERVIEW OF THE PROGRAM

A. The 1978 Pilot Program

In 1977 the National Science Foundation awarded a contract to the Center for Educational Research and Evaluation of the Research Triangle Institute (RTI) to design and implement a pilot Visiting Women Scientists Program to motivate female high school students to consider and pursue careers in science, including engineering, mathematics, and social science as well as biological and physical science. A complete description of the planning activities can be found in the final report for the design phase.[1]

The objectives established for the Visiting Women Scientists Program were:

1. To provide an opportunity for high school students to meet and interact with women scientists as role models.

2. To provide examples of women in a variety of science careers.

3. To provide evidence of women who have combined personal lives and successful careers in a variety of ways.

4. To provide information about the importance of science and scientists in solving world problems.

5. To provide information about science and technology job opportunities for women in the future (including emerging careers), and equal opportunity laws and affirmative action programs which guarantee women access to these opportunities.

6. To provide information about the preparation needed for various science careers, the importance of keeping various options open, and the sources of financial aid which are available for obtaining this preparation.

7. To encourage teachers and counselors to provide support and encouragement to women who are considering science careers.

8. To promote the attitude among both males and females that science careers are appropriate for women as well as men.

9. To encourage high school females to seek additional information about women in science careers, and to provide help in obtaining such information.

The 1978 pilot program, which included an experimental evaluation, involved visits by 40 women scientists to 110 high schools across the United States. An RTI field representative accompanied each woman scientist and was responsible

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[1] "The Development of a Visiting Women Scientists Program for Secondary Schools: Phase I Final Report," National Science Foundation, Washington, DC, October, 1977.

for working with each school to establish a schedule, for preparing each woman scientist for her visits, and for assisting during the day of the visit.

A national sample of high schools was offered the opportunity to participate in the pilot program. Those that accepted the offer were randomly assigned to experimental and control groups. Students in all schools were given the opportunity to return a postage-paid postcard to RTI for additional information; and all schools were sent a resource packet of science career materials. Each experimental school received a visit by a woman scientist and an RTI field representative.

Typically, three or four schools in a geographic area were visited in one week by an RTI field representative and a woman scientist from the area. Each visit in the pilot program consisted of some combination of the following activities: (1) a large group meeting of approximately 90 tenth grade females; (2) one or more seminars for approximately 25 females who were particularly interested in exploring science career opportunities; (3) meetings with individual classes, usually including approximately 30 females and males; (4) a meeting with school staff members, including counselors, librarians, and a representative of the science, mathematics, and social science departments; (5) a time when the woman scientist and field representative would be available to speak with interested students on an informal basis; and (6) an informal meeting with the principal and contact person.

Evaluation of the 1978 pilot program was based on data provided by students, school contact persons, women scientists, and field representatives. In addition, RTI staff members observed a number of the visits. Although there were a few problems in the pilot program, student reactions to the visits were extremely favorable, and both women scientists and school contact persons responded overwhelmingly in favor of future participation in the program.

The procedures and results of the 1978 pilot program are described in detail in the final report for the pilot program.[2]

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[2] "The Visiting Women Scientists Pilot Program, 1978, Final Report," Iris R. Weiss, Carol Place, and Larry E. Conaway, National Science Foundation, Washington, DC, August, 1978. The pilot report is available from the National Technical Information Service (NTIS), U.S. Department of Commerce, Springfield, Virginia 22161. The access number for the full technical report is PB286372/AS ($9.00), and the Highlights Report is PB286373/AS ($4.00). The pilot report has also been submitted to the Educational Resources Information Center (ERIC). The 1978-79 reports will be submitted to NTIS and ERIC in the fall of 1979.

B. The 1978-79 Program

The pilot program demonstrated that a Visiting Women Scientists Program for secondary schools is feasible. The program functioned smoothly, and based on data collected there was a great deal of interest in continuing it. In addition, comparisons between experimental and control schools demonstrated that the program was effective in encouraging high school females to seek further information about science careers. For 1978-79 the program remained essentially the same, with a few modifications suggested by pilot program experiences: (1) including ninth-grade females; (2) encouraging the arrangement of all-female groups; and (3) providing more information to school staff about the program.

The 1978-79 program involved visits by 51 women scientists to 12 junior high and high schools in North Carolina and a total of 128 schools in the areas of Los Angeles, Philadelphia, and Minneapolis-St. Paul. The North Carolina visits were carried out to test revised procedures and materials and to provide the program to the schools. The three metropolitan areas were selected in order to reduce costs and to assure diversity. Each school was visited by a woman scientist and an RTI field representative.

During the 1978-79 program the RTI field representative and a woman scientist from the local area generally visited three schools in one week, on Tuesday, Wednesday, and Thursday. Each visit consisted of some combination of the following activities: (1) one or two large group meetings of approximately 100 ninth and/or tenth grade females; (2) one or more follow-up meetings for approximately 30 females from the large group most interested in pursuing a science career; (3) one or more seminars for approximately 25 females, generally from grades 11 and 12, who were particularly interested in or suited for a science career; and (4) a meeting with various members of the school staff, including counselors, librarians, teachers, and administrators.

Since the effectiveness of the Visiting Women Scientists Program was determined during the pilot program, there was no need for an experimental-control comparison in the 1978-79 program. However, in order to ensure successful program implementation and to provide descriptive data for reporting purposes, evaluative data were again collected from students, school contact persons, women scientists, and field representatives. As in the pilot program, student reactions to the visits were very favorable; and both women scientists and school contact persons responded overwhelmingly in favor of future participation in the program.

In addition to conducting visits to schools, the 1978-79 program included two other activities: preparation of a national Women Scientists Roster, which includes information about approximately 1,300 women scientists interested in encouraging females to consider science careers, and development of a Manual on Program Operations for the use of those interested in planning and conducting similar programs.

This report presents highlights of the 1978-79 Visiting Women Scientists Program. Participating schools are described in Section II, while Section III describes the women scientists. Program operations are described in Section IV, Section V discusses evaluation, and Section VI describes the Women Scientists Roster and the Manual on Program Operations.

II. PARTICIPATING SCHOOLS

A. The Three Metropolitan Areas Included in the 1978-79 Visiting Women Scientists Program

For the 1978-79 Visiting Women Scientists Program, a cost-effective operation was devised. Rather than selecting a random sample of schools, the program was localized in three metropolitan areas of the country, and costs were reduced by using field representatives and women scientists from the respective metropolitan areas. In addition, twelve North Carolina schools were visited early in the program in order to test revised materials and procedures.

Limiting the program to three areas also helped to improve communication with school and district personnel. In the pilot program it had been necessary to restrict communication with school and district personnel to mail and telephone contact, whereas in the 1978-79 program it was possible to work more closely with district personnel in planning contact with schools. It was also possible in Philadelphia and Los Angeles to meet with a number of school representatives prior to the visit.

While the 1978-79 program was not based on a random sample, it was still considered important to include a reasonably diverse group of schools. In order to increase the number of urban schools visited, the decision was made to conduct the 1978-79 program in three metropolitan areas containing a large number of urban schools.

The three metropolitan areas chosen were Los Angeles County, the Philadelphia area, and the area surrounding Minneapolis-St. Paul. School officials in Los Angeles and Philadelphia had contacted RTI during the pilot program to indicate interest in participation, but the design of the pilot program made it impossible to accommodate them at that time. When recontacted during the planning of the 1978-79 program, school systems in both areas expressed interest in participating. Minneapolis-St. Paul was selected as a midwestern area which would provide diversity. Four of the larger districts in that area were contacted about participation, and all four indicated interest. The archdioceses of Los Angeles, St. Paul-Minneapolis, and Philadelphia were also contacted regarding their schools' participation, and each of them indicated interest in including some of their schools.

Once the three areas had been chosen for the 1978-79 Visiting Women Scientists Program and district interest determined, a number of steps were taken to obtain and contact schools, as described below.

B. Obtaining Schools

The Council of Chief State School Officers' Committee on Evaluation and Information Systems (CEIS), which has as one of its major functions the screening of research studies in public schools, reviewed and approved the plans for the Visiting Women Scientists Program.

A letter and descriptive materials were sent to Chief State School Officers (CSSO's) in each of the states which would be involved. They were asked to contact RTI if they had any questions about the program. Similarly, the superintendent of each participating district and archdiocese received a letter describing the program and a form to indicate approval to contact schools. None of the CSSO's or district superintendents raised any objections to including their schools; in fact, several wrote letters of endorsement for the program, which RTI included with materials sent to the schools.

The procedures used in selecting and contacting schools varied. In Minneapolis-St. Paul it was possible to invite all junior high and high schools in the four districts selected to participate in the program, while also including private and parochial schools. In Philadelphia and Los Angeles it was necessary to select a subset of the schools. In Philadelphia, the program was initially offered to senior high schools and to some parochial and private schools. In Los Angeles, county office personnel originally selected one high

school and an alternate per district; a few parochial and private schools were also included. Alternate schools were scheduled when originally selected schools did not wish to participate. When original contacts did not provide the desired number of schools to be visited in Philadelphia and Minneapolis-St. Paul, letters and forms were sent to invite additional districts to participate. Schools which had not yet returned a principal form were also contacted by telephone to determine interest in participation.

A letter was sent to the principal of each selected school, along with a brochure describing the Visiting Women Scientists Program. A form was included on which they were to indicate interest and provide information about possible dates for the visit and a contact person to help plan the visit.

Since many of the schools in Los Angeles and Philadelphia are part of a single school system, it was possible to arrange a meeting with representatives of the schools to be visited. RTI staff explained the purposes and procedures of the program and gave the participants, many of whom would later serve as contact persons, an opportunity to ask questions.

C. Scheduling Schools

Care was taken in scheduling visits to avoid dates on which principals indicated their school would not be in session or would have conflicting activities taking place. Only 27 schools experienced difficulty with the originally scheduled visit dates, and all but one of these was rescheduled for a visit. The most common scheduling problems were: (1) schools closed due to snow, (2) the visit date was immediately before or after vacation, and the school felt the visit would be inconvenient; and (3) the visit date conflicted with other activities such as testing, teacher workdays, or other major school functions.

D. Description of Participating Schools

One hundred and forty schools participated in the 1978-79 Visiting Women Scientists Program; this included 46 in Los Angeles County, 42 in the Minneapolis-St. Paul area, 40 in the Philadelphia area, and 12 in North Carolina. As intended, these 140 schools include a large number in urban areas, while also representing a reasonable degree of diversity.

Included in the 140 schools were 119 public schools, 15 parochial schools, and 6 independent private schools. One hundred and nine of the visits were

conducted in high schools; 20 in junior high schools; 6 in junior-senior high schools; 4 in schools with the grades K-12; and one in a school with grades 6 through 8.

The schools were distributed among a number of different community types. One percent were located in rural areas; 6 percent in small cities or towns; 62 percent in urban areas; and 31 percent in suburban areas. The smallest school visited had a total enrollment of 134 students, and the largest school had 4,350. Junior high school enrollments averaged approximately 1,049 students; junior-senior high schools averaged approximately 1,208; and the average high school enrollment was approximately 1,867.

The schools varied in their racial or ethnic composition. Over one-fourth of the schools visited in 1978-79 had greater than a 60 percent total minority enrollment. Included were 21 schools (15 percent) whose minority enrollment was greater than 90 percent.

III. WOMEN SCIENTISTS

A. Selection of Visitors

The visitors for 1978-79 were usually selected from those who expressed interest in participating in the pilot program or those who asked to be included in the Women Scientists Roster. In all three areas, industries and various minority organizations were also contacted for recommendations. However, these original sources did not provide a sufficient number of minority and industry women in Los Angeles and Philadelphia; thus, additional sources were contacted to locate women near those cities.

B. Characteristics of the Visiting Women Scientists

The composition of the group of 51 visitors by area of science, type of employment, race or ethnic background, and year of earliest degree was extremely varied. Forty-three percent of visitors were employed in an engineering career, 26 percent in physical science or mathematics, 22 percent in biological science, and 10 percent in social science. Fifty-seven percent were employed by profit-making organizations; 27 percent were academically employed; 10 percent worked for a non-profit organization; and 6 percent were government employees.

Many of the women scientists had a minority background; 24 percent were Black, and eight percent were either Asian or Hispanic. In terms of academic background, 27 percent of the visitors had obtained their doctorate; another 35 percent had a master's; and the remaining 37 percent had a bachelor's degree.

The woman scientist application form asked for the dates in which degrees had been obtained. Based on the assumption that the year of award of a bachelor's degree is a reasonable measure of age, the visitors also represented a good balance across a span of ages.

C. School Visits

The plan for the 1978-79 program was to have an RTI field representative and a local woman scientist visit three schools on Tuesday, Wednesday, and Thursday of one week. Specific scheduling difficulties associated with schools and women scientists created the need to visit some schools on Monday or Friday and to have some women scientists visit schools in different weeks. Several women conducted visits to more or fewer than three schools, but no woman scientist conducted more than three visits in one week.

Three women scientists visited one school; 16 visited 2; 22 visited 3; 7 visited 4; 2 visited 5; and 1 woman scientist visited 6 schools. Five visits were conducted with a team of two women scientists.

D. Teams of Two Women Scientists

For the 1978-79 program, five schools were visited by a team of two women scientists. The women scientists and the school staff expressed a positive feeling about having two women scientists and the field representative visit with students. The contrast between women in two different fields was enlightening and informative. It also offered the students an opportunity to obtain a more varied picture of women in science by giving them a perspective on two careers and lifestyles and allowing them to observe the interaction of three women.

A recurring difficulty with two women scientists was the lack of time. In schools' 45-60 minute periods, there was little time for anyone to make a complete presentation. This was more of a problem when one woman dominated, leaving even less time for the other woman's area of science. This situation was less of a problem when follow-up meetings were scheduled, since the extra

time allowed students an opportunity to explore additional ideas with each woman. In cases where class periods could be combined and more time allotted per meeting or where an additional day could be used, the effectiveness of the two individuals would probably be increased.

E. Problems Encountered in Scheduling Women Scientists for Visits

Overall, there were only minor operational difficulties in scheduling women scientists to conduct visits. Because the visits were conducted within a 50 mile radius of each area and nearly all the women scientists were from the same geographical area as the schools, it was relatively easy to substitute another woman scientist for a particular visit on short notice.

Suggestions had been made to utilize minority women scientists as role models in minority schools whenever possible, as well as in other schools in their geographical area. One difficulty encountered was finding minority women scientists within the area to visit some schools with large minority enrollments. Thus, it was necessary to locate minority women from other areas to conduct several visits. Minority women visited 43 of the schools which participated in the 1978-79 Visiting Women Scientists Program. Sixteen of these schools were predominantly white; the remaining 27 had greater than a 60 percent minority enrollment.

IV. DESCRIPTION OF PROGRAM OPERATIONS

A. The Field Representative

The design of the pilot Visiting Women Scientists Program included a field representative who acted as a local liaison, arranging visit details with the school contact persons and ensuring that each woman scientist was sufficiently prepared for her visits. The field representative was to reduce the burden on participating schools and women scientists and help avoid logistical problems. In the pilot program the field representatives were evaluated very highly by women scientists, school personnel, and RTI staff. For the 1978-79 program, a field representative from the pilot program visited the North Carolina schools; and three new field representatives were employed in the other areas. The new field representatives were trained in a week-long session at RTI, which included studying career materials and activities to be used in the program, as well as observation of and participation in two school visits.

After the visit dates were scheduled by RTI staff and descriptive correspondence had been mailed to the school contact persons, the field representatives worked with contact persons by telephone in arranging the specific activities for the visit. Also, after RTI staff made initial contacts with women scientists and supplied them with materials describing the program and their general role, the field representatives were responsible for informing them of the detailed schedule of meetings in each of their schools, and for discussing their specific roles and presentations. During school visits the field representatives assisted in conducting many of the meetings, and they worked with the school contact person to resolve any problems that occurred.

B. Description of Program Meetings

Prior to the visit each school received two resource packets of materials describing career opportunities in the biological, physical, and social sciences, as well as engineering and mathematics. The contact person was requested to place the resource packets in appropriate locations such as the guidance center, library, or science department.

The various types of meetings, which were generally included in the school visit schedule, are discussed below.

1. Large Group Meetings for Female Students

Schools were asked to arrange a large group meeting for their ninth and tenth grade female students, and 79 percent of the schools arranged such a meeting. Large schools often selected certain ninth or tenth grade females for the meeting, or arranged two or more meetings. Some high schools also included students from grades 11 and 12, and a few junior high schools invited seventh and eighth grade females.

Ninth and tenth grade females were a major target of the program since they could be made aware of the potential for women in science and engineering careers at a time when they could still redirect their high school program to include more mathematics and science. The general approach in the large group meetings was to provide students with an opportunity to meet a woman scientist role model and to show them examples of women in a variety of science careers.

The field representative distributed copies of Careers in Science and Technology: More Women Needed, a pamphlet developed to emphasize some of the major messages of the Visiting Women Scientists Program. She then opened the

meeting with a prepared introduction which included the following points: (1) most women work; (2) without proper planning, women may stay in low-paying, unskilled jobs; (3) there are many opportunities for women in the sciences; and (4) while you do not need to be a genius to succeed in a science career, you do need to take the necessary prerequisites. This introduction included slides of women scientists from a number of science fields, life styles, and ethnic backgrounds.

The field representative then introduced the woman scientist. Their presentations varied a great deal depending upon their areas of science and personalities. Many prepared demonstrations related to their jobs. For example, a physical scientist brought a laser and optical fiber to illustrate the technological advantages of lasers in telephone and telegraph communication. An engineer gave four simple demonstrations to illustrate that basic scientific principles are not difficult to understand. In addition, she brought her hard hat, safety glasses, and gloves, and allowed the girls to try them on as an "icebreaking" technique. An anthropologist portrayed the various specializations in her field by bringing artifacts to illustrate archaeology, skulls for physical anthropology, a turkish coffee maker for cultural anthropology, and language texts to illustrate linguistics.

The women scientists generally told students about their education, training, and personal backgrounds. Many related how they happened to choose a scientific career; some had aspired to such careers from an early age, while others seemingly stumbled into them. Some talked about the problems associated with combining a career with a family and the ways in which they resolved these problems.

After the woman scientist had completed her presentation, the field representative usually informed the students of sources for seeking additional information about science careers and the importance of early planning for a career.

2. Follow-Up Meetings

In 77 percent of schools in which a large group meeting was conducted, there was at least one follow-up meeting of approximately 30 females who had attended a large group meeting. In nearly 30 percent of the schools there were two or more follow-up meetings.

The objective of the follow-up meetings was to make informal sessions available to females who were particularly interested in exploring science

career possibilities. The major purposes of the follow-up meetings were (a) to establish and reinforce the notions that women can be interested and successful in science careers, combining these careers with full private lives, and (b) to provide specific information in response to students' questions.

An atmosphere of informality was established, and the field representative often distributed and conducted one of the program learning activities developed specifically for the 1978-79 program (a case study, a matching exercise, or materials describing career planning).

If the woman scientist had a demonstration other than the one used in the large group meeting, she would sometimes use it. If not, she often described her job in more detail, including anecdotes of experiences in her science career.

The field representative usually allowed approximately ten minutes for questions to both the visiting scientist and herself. In closing, the field representative gave each participant an opportunity to obtain a copy of Thinking About A Career in Science and Technology: A Young Woman's Choice, which was developed to help students in career planning. She usually described the pamphlet and encouraged the participants to utilize this and other sources in seeking additional information about science careers.

3. Seminars

High schools were encouraged to schedule one or more seminars for approximately 25 females from grades 11 and 12. Since juniors and seniors could not so easily redirect their high school programs to include more mathematics and science, it was suggested that school personnel select female students who were particularly interested in a science career, or who were taking electives in mathematics and science. As in the follow-up meetings, the major purposes of these seminars were (a) to reinforce the notions that women can combine successful science careers with full private lives, and (b) to provide specific information in response to the students' questions.

Most schools (77 percent) arranged at least one all-female seminar, and many schools (61 percent) arranged two or more. These seminars varied a great deal in size, depending upon interest and facilities, and some schools involved sophomores as well as juniors and seniors. Participation was limited in some schools to females taking elective mathematics and science courses; others allowed the students to decide whether or not they wanted to attend.

The field representative distributed copies of Careers in Science and Technology: More Women Needed to all participants and then gave a brief version of the structured introduction used for the large group meeting. The woman scientist was then introduced. If she had prepared a demonstration or some type of slide presentation, she often opened her presentation with it, as in the large group meetings. In these all-female seminars the woman scientist was likely to add a discussion of the problems associated with combining a successful career and a family, using personal examples or those of a colleague.

The field representative usually allowed approximately ten minutes for questions and gave each student the opportunity to obtain a copy of Thinking About A Career in Science and Technology: A Young Woman's Choice. She urged the participants to utilize available information sources in planning their career.

4. Staff Meetings

The school contact person was asked to schedule a meeting with interested staff, including the following: guidance counselors; science, mathematics, and social science teachers; school librarians; and other interested school or district personnel. Field representatives were flexible in scheduling a time period for the meeting to make it possible for as many staff members to attend as possible, e.g., before school, during lunch, or after school. The contact person was provided with copies of a descriptive memorandum for distribution to school staff members prior to the meeting.

The major purposes of the meeting were: (1) to describe the purposes of the Visiting Women Scientists Program; (2) to describe the types of meetings conducted and the information presented; (3) to acquaint them with the resource packet and other reference materials that might be of value to females; and (4) to encourage them to be sensitive to the purposes of the program and to reinforce the ideas after the visit.

Because of operational problems associated with school schedules, a staff meeting took place in only 97 of the 140 schools (69 percent). Counselors and science teachers were represented in over three-fourths of the meetings; mathematics teachers and librarians attended about half of the meetings; and social science teachers were represented in only about 30 percent of the meetings.

C. Meetings Conducted

More than 24,000 individual students participated in the three formal types of meetings at the 140 schools: 16,334 in large groups (13,189 of whom were ninth or tenth grade females) and 7,867 in seminars. In addition, 4,608 of these students attended a follow-up meeting after attendance at a large group meeting. At least one large group presentation was conducted in 111 schools. In all, there were 150 large group meetings with an average attendance of 109 students per meetings. A total of 165 follow-up meetings were conducted in the 85 schools which scheduled them, with an average of 28 students per meeting. There were 300 seminars in 108 schools, with an average of 26 students per session.

Including all participating schools, there was an average of over four meetings with students per day (615 meetings in 140 schools). Adding the 97 staff meetings to the total, the average number of meetings per day was over five (712 in 140 schools).

V. EVALUATION

A. Introduction

Experimental-control group evaluation results for the 1978 pilot program showed that the Visiting Women Scientists Program was successful in encouraging tenth grade females to seek additional information about women in science careers, and in encouraging various school personnel to use the resource packets provided in the program. There was no experimental design for the 1978-79 program, but evaluation data were collected from those who participated.

B. Female Students Seeking Information and Use of the Resource Packets

Approximately one month after the visit, the contact person at each school was asked to complete a brief questionnaire about the impact of the Visiting Women Scientists Program and the use of the resource packets.

Fifty-nine percent of schools indicated that more than the usual number of female students had sought information about science careers, while 41 percent indicated that the number was about the same as usual. Eighty-one percent of schools reported that the resource packets had been used. Students had used the resource packets in 77 percent of the schools, counselors in 57 percent, and teachers in 51 percent.

Although most schools had used the resource packets, few had ordered any of the materials listed in the List of Resource Materials. Only 17 percent of the schools indicated that they had already ordered materials, but another 50 percent indicated they had plans to order materials.

C. Student Evaluations of the 1978-79 Visiting Women Scientists Program

Students who participated in seminars or follow-up meetings were asked to complete a brief evaluation questionnaire. The program was very well received, with 92 percent of students rating it either excellent or good and less than one percent rating it poor. The percent of females rating the program excellent tended to increase with grade level. Thirty-four percent of ninth grade females rated the program excellent compared to 39 percent of those in tenth grade, 40 percent of those in eleventh grade, and 43 percent of twelfth graders. However, it should be noted that many of the participating juniors and seniors had been chosen specifically for their interest in science, and this undoubtedly affected the ratings.

The 1978-79 Visiting Women Scientists Program was conducted by four different field representatives and 51 different women scientists. Student ratings for the four field representatives were quite consistent. For all of the students visited by each field representative the percent rating the program either excellent or good varied from 90 to 97 percent.

There was no discernible pattern of program ratings based on the characteristics of the women scientists who participated in the program. When analyzed separately for each of the 51 women scientists, the percent of students rating the program excellent varied considerably, from 9 to 73 percent; and the percent rating the program either excellent or good varied from 73 to 100 percent, with the majority of women scientists in the 90 to 100 percent range. However, the group of scientists with the highest ratings and the group with the lowest ratings each included women from a variety of science areas, types of employment, ages, and degree levels.

Students who attended follow-up meetings were a little more likely to rate the program excellent than were those who attended seminars, but the percent rating those meetings excellent or good was the same (92 percent). Though questionnaires were not obtained for most large group meetings, they were considered to be the least effective type of meeting by field representatives and RTI staff. However, the more highly structured presentations used

in the 1978-79 program generally increased their effectiveness, according to those involved in both the pilot and 1978-79 programs.

In addition to rating the overall program, students were asked to indicate the parts of the program they particularly liked. Sixty-five percent of the students liked very much "learning about careers for women in science," and 32 percent liked that part of the program somewhat. The women scientists' talks were also very highly rated (54 percent liked them very much and 43 percent liked them somewhat). All aspects of the program were well received by students.

Students were also asked to rate the program's value to them in a number of ways. The program was rated either somewhat valuable or very valuable in each of the five ways by at least 91 percent of the students. As measured by the percent of "very valuable" responses, the Visiting Women Scientists Program was most successful in communicating the importance of keeping one's options open by taking mathematics and science in high school. There were also particularly high ratings for encouraging students to seek further information and for showing that women can successfully combine careers and family lives.

D. Interest in Future Participation in the Visiting Women Scientists Program

Only one woman scientist answered "no" when asked if she would be interested in participating in the Visiting Women Scientists Program in the future. In addition, contact persons were asked whether they would be willing to serve again if their schools participated in the future. Contact persons in 96 percent of the schools responded "yes."

When asked if the Visiting Women Scientists Program was of value to their students, contact persons in 99 percent of the schools said "yes." When asked if their schools would like to participate in the future, 98 percent indicated they would.

E. Comparison of the 1978 Pilot Program and the 1978-79 Program

The 1978 pilot program and the 1978-79 program were very similar in design, although some modifications were made for the 1978-79 program, based upon recommendations from those involved in the pilot experience. As might be expected, evaluation results for the two years were very similar.

The Visiting Women Scientists Program was very well received by all participants in both years. Nearly all women scientists and school contact persons expressed an interest in future participation, and a vast majority of the students rated the program excellent or good. Field representatives were highly rated by women scientists and school contact persons in both years, and the work done by the contact persons was much appreciated by the visitors.

Comparative ratings show a small increase from the pilot program to the 1978-79 program. This probably can be attributed to modifications made from recommendations of participants in the pilot effort. Most of these modifications involved one of the following: revised program materials; more highly structured presentations using ideas to which the students were most responsive; and improved training and orientation of field representatives and women scientists.

VI. THE WOMEN SCIENTISTS ROSTER AND MANUAL ON PROGRAM OPERATIONS

A. The Women Scientists Roster

As a result of suggestions from school personnel and women scientists who participated in the pilot program, it was determined that a national Women Scientists Roster would be developed for the use of schools, districts, and organizations interested in conducting similar programs. This roster includes approximately 1,300 women scientists who are interested in encouraging females to consider science careers. It includes women from the 50 states, Canada, Puerto Rico, and the District of Columbia. Represented are women from all areas of science and a variety of educational, employment, and race or ethnic background categories.

The roster was developed by contacting nearly 900 women who had expressed interest in participating in the pilot program. Then, during the fall of 1978 and spring of 1979 the roster's development was announced in the NSF Bulletin and other professional publications. Women interested in being on the roster were asked to return information to RTI.

The Women Scientists Roster consists of two lists. One is ordered alphabetically by last name and contains all available information about each woman: name, mailing address, phone number, general area of science, specific science field, highest degree, 1978 employment, and race or ethnic background.

The second list is ordered alphabetically by state, numerically by zip code, then alphabetically by last name. This list also shows the city, general area of science, and race or ethnic background of each woman.

The roster will be available through The National Science Teachers' Association, an affiliate of the American Association for the Advancement of Science, at 1742 Connecticut Avenue, NW, Washington, DC 20009.

B. The Manual on Program Operations

Through the pilot and 1978-79 Visiting Women Scientists Programs, RTI gained considerable knowledge about planning and implementing school visits by women scientists for the purpose of encouraging female students to consider careers in science and technology. The Manual on Program Operations was designed to share the experience gained over the last two years with others who may wish to design and conduct similar programs.

The Manual presents the following: an overview of the program; a description of the materials and procedures used, discussing those which were discontinued or revised; and recommended steps which can be taken to avoid potential problems. It will be submitted to the National Technical Information Service (NTIS) and Educational Resources Information Center (ERIC).